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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/904,192	07/11/2001	Gary A. Demos	07314-010001	1218
20985	7590	11/18/2004	EXAMINER	
FISH & RICHARDSON, PC 12390 EL CAMINO REAL SAN DIEGO, CA 92130-2081			HANEY, MATTHEW J	
			ART UNIT	PAPER NUMBER
			2613	

DATE MAILED: 11/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/904,192

Applicant(s)

DEMOS, GARY A.

Examiner

Matthew Haney

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-48 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities: On Page 11, Paragraph [0039], the examiner asks that the Patent Number be placed in the given blank for the invention titled "Improved Interpolation of Video Compression Frames".

Also the specification and drawings are objected to because the fast search methods are not specified as to whether they should be done in series or parallel.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 3, 7, 17, 19, 23, 33, 35, and 39 are rejected under 35 U.S.C. 102(e) as being anticipated by Kurak (US 6,697,427).

As for claims 1, 17, and 33, Kurak teaches of applying at least two fast motion estimation search methods to a set of video images and selecting a candidate best match motion vector for each search method (Note: Kurak teaches of a method that can use up to three motion estimation searches, Column 14, Lines 7-20); selecting a best

motion vector from the candidate best match motion vectors (Note: the selection is done with the refined results which would pick the best match , Column 13, Lines 33-67, Column 14, Lines 1-29); applying the best match motion vector to compress the set of video images (Column 13, Lines 65-67, Column 14, Lines 1-6).

As for claims 3, 7, 19, 23, 35, and 39, most of the limitations of the claim have been discussed in the above rejection of claim 1. Kurak teaches of each fast motion estimation search method applied to sub-pixels (Column 14, Lines 18-20).

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2, 4-6, 8-16, 18, 20-22, 24-32, 34, 36-38, and 40-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurak (US 6,697,427).

As for claims 2, 10, 18, 26, 34, and 42, Kurak teaches of applying an AC match criteria to determine an AC best match (i.e. FD-MAD, See Column 7, Lines 29-54) motion vector (Column 14, Lines 21-29); applying a DC match criteria to determine a DC best match motion vector (Column 14, Lines 7-20). Kurak does not teach of selecting the better match of the AC best match motion vector and the DC best match motion vector to be the candidate best match motion vector for the search method. Although Kurak does not explicitly teach of combining the AC and DC matches to

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determine the best one, Kurak does teach of using the spatial domain matching technique as a second or third tier and then using another algorithm to determine which one is a better match (Column 14, Lines 25-29). It would have been obvious to one of ordinary skill in the art at the time of the invention to take the AC match (first tier) and take the DC match (second tier) and combined them together to find the best result because by separating the AC and DC components a better frequency match can be obtained but leaving the DC match within the overall algorithm allows for a best match to be found.

As for claims 4, 20, and 36, Kurak teaches of each fast motion estimation search method applied to full pixels (Note: The use of full pixel search is done throughout the reference as is evident by Column 8, Lines 25-33).

As for claims 5, 21, and 37, Kurak teaches of performing a sub-pixel motion search on the set of video images, based on the best motion vector, to generate a set of sub-pixel motion vectors (Column 14, Lines 18-20); and selecting, as the best match motion vector, the best motion vector from the set of sub-pixel motion vectors (Note: the overall process determines whether the result is a best match, Column 14, Lines 7-20).

As for claims 6, 8, 22, 24, 38, and 40, most of the limitations of the claim have been discussed in the previous rejection of claim 1 and 5. Kurak does not explicitly teach of using the AC and DC techniques within the sub-pixel range, however, it is considered an obvious variation to apply the techniques within the sub-pixel range because this would result in a more accurate but more computationally intensive search.

As for claims 9, 25, and 41, Kurak teaches of a method for determining the quality of motion vector determinations for a set of video images in a motion-compensated video compression system, including applying an AC match algorithm in determining best match motion vector candidates for the set of video images (Column 12, Lines 58-67 and Column 13, Lines 1-16).

As for claims 11, 27, and 43, most of the limitations of the claim have been discussed in the previous rejection of claim 10. Kurak teaches of preferentially selecting the AC match algorithm in determining motion vectors for wide dynamic range and wide contrast range images (Note: the DC component is removed when high contrast images are compared, Column 7, Lines 29-54).

As for claims 12, 28, and 44, most of the limitations of the claim have been discussed in the previous rejection of claim 10. Kurak does not explicitly teach of preferentially selecting the DC match algorithm in determining motion vectors for images having changing contrast. It is considered obvious that a DC match between two changing contrast MV's would result in an accurate overall match because by taking the average value of the contrast (this level of detail is less important than the high frequency components) of the images a fast match can be found without computational burden (Column 7, Lines 16-67). (Official Notice)

As for claims 13, 29, and 45, most of the limitations of the claim have been discussed in the previous rejection of claim 10. Kurak teaches of the AC match algorithm has frequency components, and further including scaling the frequency components while applying the AC match algorithm to find a best match (Note: Kurak

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teaches of subtracting the DC component to maximize the frequency match, Column 7, Lines 29-54).

As for claims 14, 15, 30, 31, 46, and 47, most of the limitations of the claim have been discussed in the previous rejection of claim 10. Kurak does not explicitly teaches of the DC match uses at least an RGB difference match or at least a luminance match, however, it is considered inherent that doing a only a luminance match (instead of luminance and chrominance) would have been obvious to one of ordinary skill in the art at the time of the invention because it would reduce computation time.

As for claims 16, 32, and 48, most of the limitations of the claim have been discussed in the previous rejection of claim 10. Kurak teaches of conveying the type of best match to a subsequent coding process (Note: a programmer would be able to code the process as well as change the variables, Column 14, Lines 32-34).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew Haney whose telephone number is 703-305-4915. The examiner can normally be reached on M-Th (7-4:30), Every Other Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Kelley can be reached on 703-305-4856. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Matthew Haney  
Examiner  
Art Unit 2613

mjh

  
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